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PCOUS 98/22372 H72

## Sertifikaat

REPUBLIEK VAN SUID-AFRIKA

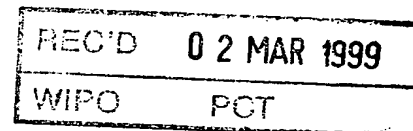
## Certificate

PATENTKANTOOR

PATENT OFFICE

DEPARTEMENT VAN HANDEL  
EN NYWERHEID

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF TRADE  
AND INDUSTRYHiermee word gesertifiseer dat  
This is to certify that

- 1) South African Patent Application No. 97/9486 accompanied by a Provisional Specification was filed at the South African Patent Office on the 23rd October 1997, in the names of 1. Jacobus Johannes Viljoen, Gregory John Claughton and Jacobie Janse Muller in their capacities as Trustees for the time being of the J J Viljoen Family Trust, 2. Ekkehard Walter Moisel and 3. Gilbert Theo Hinze in respect of an invention entitled: "The use of an aqueous solution in the preparation of a medicament for use in the treatment of lives animals".
- 2) The photocopy attached hereto is a true copy of the provisional specification and drawings filed with South African Patent Application No. 97/9486.

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November 1998

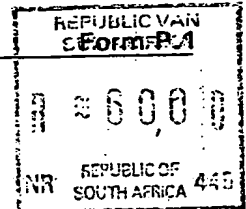
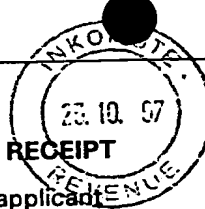
Registrateur van Patente  
Registrar of Patents

**D.M. KISCH INC. , Johannesburg**

**REPUBLIC OF SOUTH AFRICA  
PATENTS ACT, 1978**

**APPLICATION FOR A PATENT AND ACKNOWLEDGEMENT OF RECEIPT**  
(Section 30 (1) - Regulation 22)

The grant of a patent is hereby requested by the undermentioned applicant on the basis of the present application filed in duplicate.



PATENT APPLICATION NO.	
21	01 979486

AGENT'S REFERENCE
P/97/75786

FULL NAME(S) OF APPLICANT(S)	
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71	1. JACOBUS JOHANNES VILJOEN; GREGORY JOHN CLAUGHTON and JACOBIE JANSE MULLER in their capacities as Trustees for the time being of the JJ VILJOEN FAMILY TRUST 2. EKKEHARD WALTER MOISEL 3. GILBERT THEO HINZE
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TITLE OF INVENTION	
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54	THE USE OF AN AQUEOUS SOLUTION IN THE PREPARATION OF A MEDICAMENT FOR USE IN THE TREATMENT OF LIVE ANIMALS
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	THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2. The earliest priority claimed is
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	THIS APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO. 21 01
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	THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND BASED ON APPLICATION NO. 21 01
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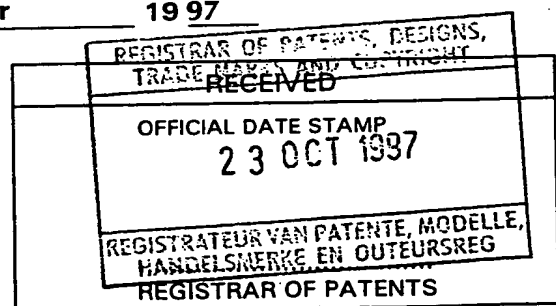
THIS APPLICATION IS ACCOMPANIED BY :	
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X	1	A single copy of a provisional <del>xxxxxxx</del> complete specification of 6 pages.
	2	Drawings of sheets.
	3	Publication particulars and abstract ( Form P.8. in duplicate ).
	4	A copy of Figure of the drawings for the abstract.
	5	An assignment of invention.
	6	Certified priority document(s) ( State number ).
	7	Translation of priority document(s).
	8	An assignment of priority rights.
	9	A copy of Form P.2 and specification of S.A. Patent Application No. 21 01
	10	A declaration and power of attorney on Form P.3.
	11	Request for ante-dating on Form P.4.
	12	Request for classification on Form P.9.
	13	

DATED THIS 23 rd DAY OF October 19 97

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*Patent Attorneys & Trademark Agents  
Attorneys & Notaries*

Form P.6

**REPUBLIC OF SOUTH AFRICA**

**PATENTS ACT, 1978.**

**PROVISIONAL SPECIFICATION**

( Section 30 (1) - Regulation 27 )

PATENT APPLICATION NO.			LODGING DATE.		AGENT'S REFERENCE
21	01	979486	22	23-10-1997	P/97/75786

FULL NAME(S) OF APPLICANT(S)	
71	1. JACOBUS JOHANNES VILJOEN; GREGORY JOHN CLAUGHTON and JACOBIE JANSE MULLER in their capacities as Trustees for the time being of the JJ VILJOEN FAMILY TRUST 2. EKKEHARD WALTER MOISEL 3. GILBERT THEO HINZE

FULL NAME(S) OF INVENTOR(S)	
72	GILBERT THEO HINZE

TITLE OF INVENTION	
54	THE USE OF AN AQUEOUS SOLUTION IN THE PREPARATION OF A MEDICAMENT FOR USE IN THE TREATMENT OF LIVE ANIMALS

This invention relates to the use of an aqueous solution in the preparation of a medicament for use in the treatment of live animals.

For the purposes of this specification, the term "animal" should be construed to include within its meaning sheep, cattle, goats, pigs, chickens, ostriches, reptiles and the like; and the term "medicament" should be construed to include within its meaning oral bactericides and bactericidal inhalants. The Applicant envisages that the invention will particularly advantageously be applicable in the preparation of a medicament for use in the treatment of weaner piglets and chicklets.

In accordance with a first aspect of the invention, there is provided the use of an aqueous anion-containing solution in the preparation of a medicament for use in the treatment of a live animal.

The aqueous anion-containing solution may be prepared by means of electrolysis of an aqueous solution of a salt. The salt may be sodium chloride. In particular, it may be non-iodated sodium chloride or potassium chloride.

The anion-containing solution and the associated cation-containing solution may be produced by an electro-chemical reactor or so-called electrolysis machine. The anion-containing solution is referred to hereinafter for brevity as the "anolyte solution" and the cation-containing solution is referred to hereinafter for brevity as

the "catholyte solution".

The anolyte solution may be produced from a 10% aqueous NaCl solution, electrolysed to produce radical cation and radical anion species, the anolyte solution having an extremely high redox potential of about +1170 mV. These species may be labile and after about 48 hours the various radical species may disappear with no residues being produced.

The anolyte solution may have a pH of about 2-7 and a redox potential of about +1170 mV. The anolyte solution may include species such as  $\text{ClO}$ ;  $\text{ClO}^-$ ;  $\text{HClO}$ ;  $\text{OH}^-$ ;  $\text{HO}_2^-$ ;  $\text{H}_2\text{O}_2$ ;  $\text{O}_3$ ;  $\text{S}_2\text{O}_8^{2-}$  and  $\text{Cl}_2\text{O}_6^{2-}$ .

These species have been found to have a synergistic anti-bacterial and/or anti-viral effect which is generally stronger than that of chemical bactericides and has been found to be particularly effective against viral organisms and spore and cyst forming bacteria.

The catholyte solution generally may have a pH of about 12-13 and a redox potential of about -980 mV. The catholyte solution may include species such as  $\text{NaOH}$ ;  $\text{KOH}$ ;  $\text{Ca}(\text{OH})_2$ ;  $\text{Mg}(\text{OH})_2$ ;  $\text{HO}^-$ ;  $\text{H}_3\text{O}_2^-$ ;  $\text{HO}_2^-$ ;  $\text{H}_2\text{O}_2^-$ ;  $\text{O}_2^-$ ;  $\text{OH}^-$ ;  $\text{O}_2^{2-}$ .

The method of treatment may include soaking, rinsing or dipping the animal in the anolyte solution, applying the anolyte solution as an inhalant via an atomising or fogging process or administering the anolyte solution orally. The soaking, rinsing or dipping process is suitable for animals which can be handled with relative ease. The redox potential of the anolyte solution may be monitored during the process so that the treatment process may be monitored and controlled on a continuous basis. The atomising or fogging process is suitable for animals such as weaner piglets and chicklets which are susceptible to stress and accompanying weight loss. The anolyte can also be applied by an atomising process in air ducting systems to destroy airborne micro-organisms and to destroy micro-organisms present in the airways and lung tissue by inhalation.

The treatment of the animal as described above has been found to improve the weight gain as a result of the anti-microbial action of the anolyte solution.

The Applicant believes that the oxidising free radicals present in the anolyte solution act synergistically at a bacterial cellular level.

It has been found that the efficacy of the use of the anolyte solution in the preparation of a medicament for use in the treatment of live animals depends upon the concentration of the anolyte, as measured by the oxidation-reduction potential (ORP), or redox potential of the anolyte solutions, the exposure time, i.e. the

contact time between the contaminated animal and the anolyte solution and the temperature during application. By measuring the redox potential of the anolyte solution during the treatment, for example, of a weaner piglet, the available free radical concentration can be determined and monitored. Anolyte has been found to be more effective at lower than at higher temperatures.

An embodiment of the invention will now be described with reference to the accompanying experiments.

In a series of experiments, the bactericidal effect of the anolyte solution was tested on weaner piglets. The results are set out in Table 1 below.

The anolyte was added to the drinking water of the weaner piglets over a period of 14 days and the results were measured in terms of average weight after the 14 day period. The average weight of the administered groups were compared with the average weight of the unadministered groups. The relative weight gain of the administered groups is shown in the table.

It will be appreciated that many variations in detail are possible without departing from the scope and/or spirit of the invention as defined in the consistory statements hereinbefore.

	Determinant	Trial Groups			
		<u>R1TM</u>	<u>R2TF</u>	<u>R3CF</u>	<u>R4CM</u>
Treatments	Anolyte in drinking water - days	14	14	0	0
	ORP range (mV)	600-650	600-650	-	-
	Replenishment (days)	2	2	-	-
	Anolyte Fogging ( $\mu$ -min- $m^3$ )	-	-	-	-
	Fogging Interval	-	-	-	-
Growth Performance	No per group				
	(9/10/97) Day 0 x L Mass	8,24	6,08	7,66	6,01
	L Mass range	-	-	-	-
	(22/10/97) Day 13 x L Mass	9,97	8,84	10,06	7,94
	L Mass range	11,5-8,5	11,0-8,0	12,0-8,5	11,0-5,5
	A D G	0,133	0,212	0,185	0,148
	Day 28 x L Mass				
	L Mass range (7/10/97) A D G				
Treatment Courses Required	Diarrhoea pig/group	(18%)	(12,5%)	(37,5%)	(100%)
	% E.coli swabs + ve				
	Respiratory pigs/group	(6,25%)	(12,5%)	(18,75%)	(100%)
	Isolates				
	Cost of Treatment/group	R14,00	R14,00	R31,50	R126,00
	Cost of Treatment/group	R0,88	R0,88	R1,97	R7,41

Dated this 23rd day of October 1997

Patent Attorney for Applicant